

UNIVERSITY OF CALIFORNIA  
COLLEGE OF AGRICULTURE  
AGRICULTURAL EXPERIMENT STATION  
BERKELEY, CALIFORNIA

SERIES ON CALIFORNIA CROPS AND PRICES

# ASPARAGUS

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BULLETIN 487

JANUARY, 1930

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CONTRIBUTION FROM THE  
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS

UNIVERSITY OF CALIFORNIA PRINTING OFFICE  
BERKELEY, CALIFORNIA

1930

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# ASPARAGUS<sup>1</sup>

H. R. WELLMAN<sup>2</sup> AND E. W. BRAUN<sup>3</sup>

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## SUMMARY

Practically all of the canning asparagus and about 45 per cent of the table asparagus produced in the United States are grown in California. Of the total bearing acreage of 55,640 acres in this state in 1929 approximately 93 per cent was in the Delta district.<sup>4</sup> This district contributes all of the canning asparagus and about 90 per cent of the carlot shipments of table asparagus from California. The other areas in the state producing table asparagus are in Imperial, Fresno, Los Angeles, Riverside, and Orange counties.

Between 1922 and 1926 there was an increase of 122 per cent in the bearing acreage in the Delta, most of which occurred in the last two years of that period. The very high prices which growers received in 1923 and 1924 greatly stimulated plantings. In those two years 20,000 acres were planted, which was equal to 91 per cent of the total bearing acreage in 1922. These plantings, however, did not result in a corresponding increase in bearing acreage until two years later, since asparagus does not usually come into bearing until the second year after the crowns are planted. As contrasted with the rapid expansion just described, the increase during the past three years has been small. In 1929 the bearing acreage in the Delta amounted to 51,600 acres, only 2,600 acres larger than in 1926. Judging from the recent plantings and the acreage that will normally go out of production in the next two years, the bearing acreage in 1931 will be about 7 per cent larger than in 1929.

During the past eight years there has been a pronounced upward trend in production in the Delta, rising from 1,300,000 cannery boxes

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<sup>4</sup> The Delta district includes an area of approximately 300,000 acres of peat and sedimentary soils at the confluence of the Sacramento and San Joaquin rivers. About 90 per cent of this area is deep, soft, fibrous, and porous peat land. It is high in organic material and has a good water-holding capacity. These characteristics are highly desirable for asparagus culture.

in 1921 to 3,870,000 cannery boxes in 1929. It appears, however, that the peak of production has about been reached, at least for the time being. With normal yields production during the next two years may be expected to average only about 5 per cent above the average of the past two years.

The actual production in the Delta in 1929 was about 6 per cent below the estimated trend. The unusually cool weather during the cutting season reduced the yield.

At the present time about 75 per cent of the asparagus produced in the Delta is utilized for canning and about 25 per cent for fresh consumption.

The canned pack of asparagus, which remained practically stationary at around 967,000 cases from 1916 to 1921, has increased rapidly during the past eight years. In 1929 it amounted to 2,673,000 cases, an increase of 176 per cent over the 1916–1921 average. Despite this enormous increase the canners' opening prices were 14 per cent higher in 1929 than in 1921.

The situation during that period, however, was not without its difficulties. The pack of 1924, which was 18 per cent larger than in any previous year, did not move readily into consumption at the high prices asked at the beginning of the season, and the carryover into the 1925 season amounted to about 170,000 cases. As a result the opening price, which was \$3.85 a dozen cans in 1924, was reduced to \$3.10 a dozen in 1925. In 1926, with a pack 28 per cent larger than in 1925, a further reduction of 10 cents a dozen in the opening price was made. The lower prices, together with the extensive advertising campaign which was started in that year, greatly stimulated consumption. About 25 per cent more canned asparagus was sold in 1926 than in 1925. And in 1927 and 1928, despite small advances in opening prices, sales continued to increase, although at a somewhat slower rate.

Viewing the period 1921–1929 as a whole, it is clearly evident that there was a substantial increase in the demand for canned asparagus. People were not only eating much more canned asparagus at the end of the period than at the beginning, but they were also paying more per can for it. Many factors contributed to this increase in demand. The purchasing power of consumers has been at a relatively high level. The tendency towards the greater consumption of fruits and vegetables and the increased use of canned goods in general have been reflected in an increased consumption of canned asparagus. The packing of asparagus in picnic tins has made it readily available to the small

family. And the national advertising campaign instituted by the Canners' League of California has done much to call the attention of consumers to the merits of the product.

Not only has there been a constantly expanding market for canned asparagus in this country, but foreign countries also have increased their purchases. In fact, the relative increase in exports has been even greater than the increase in the canned pack. In 1922 only 11 per cent of the canned pack was exported as against 18 per cent in 1928.

Judging from the facts just presented, the outlook for canning asparagus is favorable. Growers should not, however, jeopardize the present favorable position by planting too large an acreage. During the next two or three years, plantings no larger than those in 1929 will apparently take care of the necessary replacements and in addition provide for a further substantial increase in demand.

California table asparagus, as contrasted with canning asparagus, meets with considerable competition from that grown in other states. The shipping season in California starts in February and extends through June. The bulk of the crop, however, is shipped in March and April. Until about the middle of April the larger proportion of California shipments go to eastern markets, but thereafter most of them go to markets within the state. This is largely the result of the increase in the supplies in the eastern markets from other states. During the latter part of March and in April receipts from South Carolina and Georgia arrive in the eastern markets, while in April, May, and June receipts from the late-producing states, such as New Jersey, Illinois, Washington, Delaware, and Maryland arrive there. It is only during the first part of the shipping season that California asparagus escapes competition in the eastern markets from that grown elsewhere.

About 90 per cent of the total receipts of California asparagus at New York arrive in March and April. The chief factor affecting changes in the weekly average prices of California asparagus during these two months is changes in the supply. Light receipts are generally accompanied by high prices, heavy receipts by low prices. In the past six seasons an average of 88 per cent of the variations in the weekly average prices of California asparagus at New York during March and April can be accounted for by changes in receipts of asparagus, which leaves only 12 per cent to be explained by other factors, such as changes in the average quality and size of asparagus and the supply of competing vegetables.

During the three years 1921-1923 the annual average prices of table asparagus were high, averaging \$5.90 a crate at New York and



\$3.75 a crate at San Francisco. During the past three years, however, prices have been much lower, averaging only \$4.35 a crate at New York and only \$2.70 a crate at San Francisco. That decline was largely the result of the great increase in carlot shipments, not only from this state, but also from South Carolina and Georgia. The combined shipments from these three states have increased from an average of 517 cars a year in 1921-1923 to an average of 1,974 cars a year in 1927-1929. Approximately 69 per cent of that increase was from California, 22 per cent from South Carolina, and 9 per cent from Georgia.

It is not expected that the upward trend in shipments from this state will continue during the next two or three years. With normal weather conditions shipments will, of course, be considerably larger than they were in 1929 when the unusually low temperatures which prevailed in the Delta reduced the yields, but it is not likely that they will average much above those of 1928. On the other hand, a further increase in the trend of shipments from both South Carolina and Georgia may be expected. The acreage in South Carolina was 32 per cent larger in 1928 than in 1926, while in Georgia it was 29 per cent larger. These increases, however, have not yet been reflected in corresponding increases in production since asparagus does not come into full bearing for several years after it is planted. Consequently, California growers may expect increasing competition from those states in the eastern markets during the next few years. Only in particularly favorable localities, therefore, are additional plantings of asparagus for fresh consumption alone likely to be warranted at this time.

### ASPARAGUS ACREAGE, UNITED STATES

*Acreage by States, 1928.*—In 1928 about 95,000 acres in the United States were devoted to the commercial production of asparagus. The distribution of that acreage is shown in figure 1. It will be noted that approximately 65 per cent of the total was in the three Pacific Coast

TOTAL ASPARAGUS ACREAGE, UNITED STATES, 1928

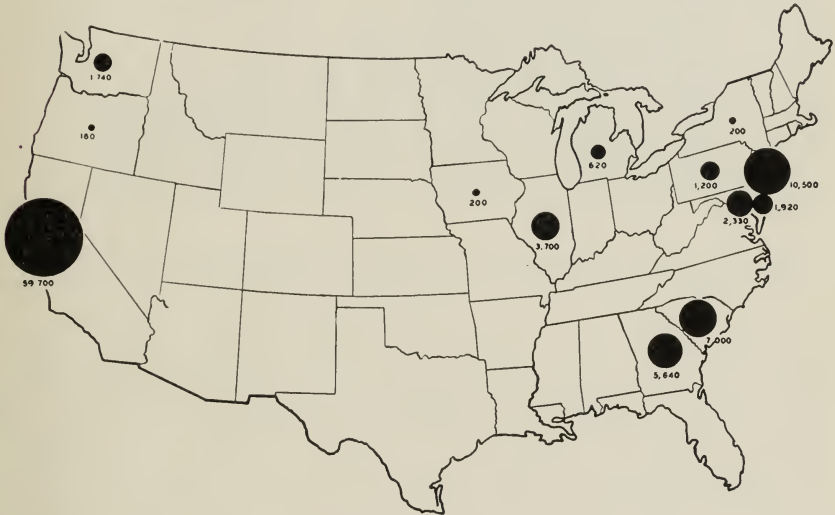


Fig. 1.—California is the leading asparagus-producing state, containing approximately 63 per cent of the total acreage in the United States.

(Data from table 12.)

states of California, Washington, and Oregon; 17 per cent in the five North Atlantic states of New Jersey, Maryland, Delaware, Pennsylvania, and New York; 13 per cent in the two South Atlantic states of South Carolina and Georgia; and 5 per cent in the three Mid-western states of Illinois, Michigan, and Iowa.

California is by far the leading asparagus-producing state, having approximately 63.0 per cent of the total acreage in this country. New Jersey, the second in importance, has only 11.1 per cent of the total acreage, while South Carolina and Georgia have only 7.4 and 5.9 per cent respectively.

*Bearing Acreage by Districts in California, 1929.*—The bulk of California asparagus is produced in the Delta district. In 1929 this

region had 92.7 per cent of the 55,640 bearing acres in the state (table 1); Imperial Valley had 3.9 per cent of the total, and the Mendota district in Fresno County 1.8 per cent. The other 1.6 per cent was scattered throughout the three counties of Los Angeles, Riverside, and Orange (see table 1).

TABLE 1

## BEARING ACREAGE OF ASPARAGUS BY DISTRICTS IN CALIFORNIA, 1929

District	Acres	Per cent of total
Sacramento and San Joaquin Delta.....	51,600	92.7
Imperial Valley.....	2,180	3.9
Mendota (Fresno county).....	1,000	1.8
Los Angeles, Riverside, and Orange counties.....	860	1.6
Total.....	55,640	100.0

Source of data: Cannery League of California.

## ACREAGE AND PRODUCTION, DELTA DISTRICT, CALIFORNIA

*Trend of Bearing Acreage.*—The bearing acreage of asparagus in the Delta District of California from 1918 to 1929 is shown by the black bars in figure 2. For several years before 1919 the bearing acreage remained practically stationary at around 15,000 acres. In 1919 the trend of bearing acreage started upward. The increase during the four years of 1919 to 1922 amounted to 7,000 acres. That increase, however, was small as compared with that which occurred during the next four years. In 1922 the bearing acreage amounted to 22,000 acres; by 1926 it amounted to 49,000 acres, an increase of 27,000 acres or 122 per cent. Since 1926, however, there has been only a slight upward trend. The bearing acreage in 1929 was only 2,600 acres larger than in 1926.

The forecast of bearing acreage for the two years of 1930 and 1931 is shown by the shaded bars in figure 2. It is expected that the bearing acreage in 1931 will be about 7 per cent larger than in 1929.

*Plantings Necessary to Maintain Present Bearing Acreage.*—The age distribution of the asparagus acreage gives a basis for judging the number of acres that will normally have to be planted in order to maintain a specified acreage in bearing. An asparagus bed comes into bearing at two years of age and usually produces for a period of about eleven years. The acreage planted in 1928, therefore, will be in bearing in 1930, and that planted in 1929 will be in bearing in 1931.



BEARING ACREAGE OF ASPARAGUS, DELTA DISTRICT, CALIFORNIA, 1918-1929, AND FORECAST OF BEARING ACREAGE, 1930-1931

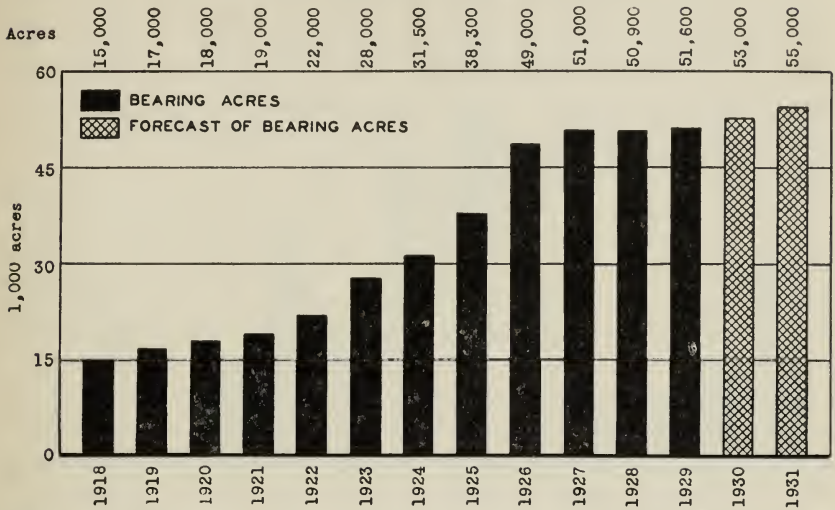


Fig. 2.—The bearing acreage of asparagus in the Delta increased very rapidly between 1922 and 1926; since 1926 it has increased only slightly.

(Data from table 2.)

ESTIMATED PLANTINGS NECESSARY TO MAINTAIN PRESENT BEARING ACREAGE OF ASPARAGUS IN THE DELTA DISTRICT OF CALIFORNIA, 1930-1935

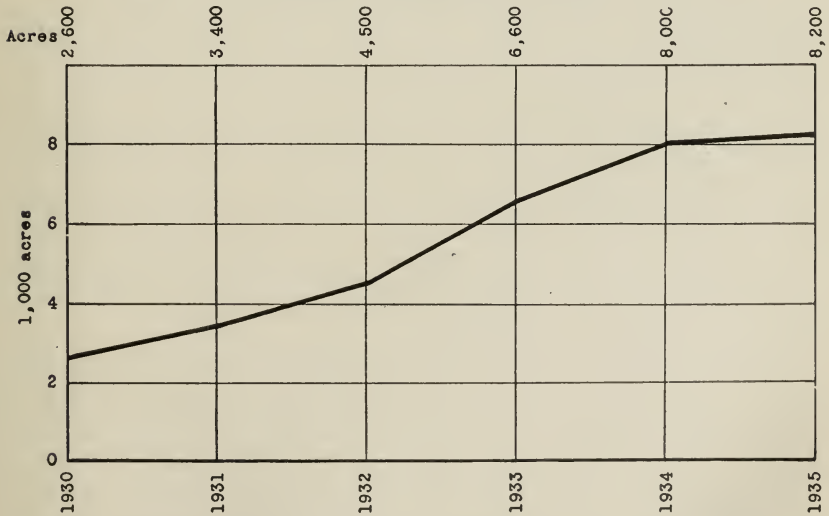


Fig. 3.—Within a few years relatively large plantings of asparagus in the Delta will be needed for replacements.

(Data are three-year moving averages of plantings. Acres planted in the Delta each year from 1918 to 1929 are given in figure 4.)

On the other hand, the acreage planted in 1917 will ordinarily be out of production by 1930, while that planted in 1918 will ordinarily be out of production by 1931. There is, of course, considerable variation in the bearing life of asparagus beds. In estimating, therefore, the acreage that will be removed in the fall of 1930 and which will not be cut in 1931, an average of the plantings for the three years of 1917–1919 may be used rather than the plantings for only 1918. The same procedure may be followed in the other years.

Figure 3 shows the estimated number of acres that will ordinarily have to be planted in the Delta each year from 1929 to 1935 in order to fully replace the acreage that will normally go out of production two years later. It is estimated, for example, that around 2,600 acres will normally go out of production in 1932. Since an asparagus bed does not come into bearing until two years of age it is necessary to plant at least as large an acreage in 1930 as will normally go out of bearing in 1932, if the present bearing acreage is to be maintained. Indications are, however, that the plantings in 1930 will be even larger than in 1929 when they amounted to about 5,800 acres. According to the estimates in figure 3 such large plantings as those of 1929 will not be needed to maintain the present bearing acreage until 1932 or 1933. In 1934 and 1935, however, even larger plantings will be necessary since an average of about 8,100 acres will normally go out of bearing in each of the two years of 1936 and 1937.

*Plantings in the Delta, 1919–1929.*—The number of acres of asparagus planted in the Delta each year from 1918 to 1929 is shown by the black bars in figure 4. During the first seven years of that period there was a very pronounced upward trend in plantings. In the two years of 1923 and 1924 a total of about 20,000 acres were planted as against a total of about 3,440 acres during the two years of 1919 and 1920. In 1925 and again in 1926 plantings were greatly reduced. In 1926 they were smaller than in any year since 1919 and were only 15 per cent as large as in 1924. During the past three years there has been a steady increase in plantings, rising from less than 1,700 acres in 1926 to over 5,800 acres in 1929.

*Relation Between Age of Beds and Yield per Acre.*—The average yields of asparagus in the Delta at various ages is shown in figure 5. A field usually begins to produce the second year after the crowns are planted. The production that year, however, is very light, amounting on the average to only 20 cannery boxes per acre. During the next two years yields increase rapidly. At four years of age production averages around 75 boxes per acre. From four to six years of age there is a further increase in yield, but it is small as compared with that

PLANTINGS OF ASPARAGUS, DELTA DISTRICT, CALIFORNIA, 1918-1929

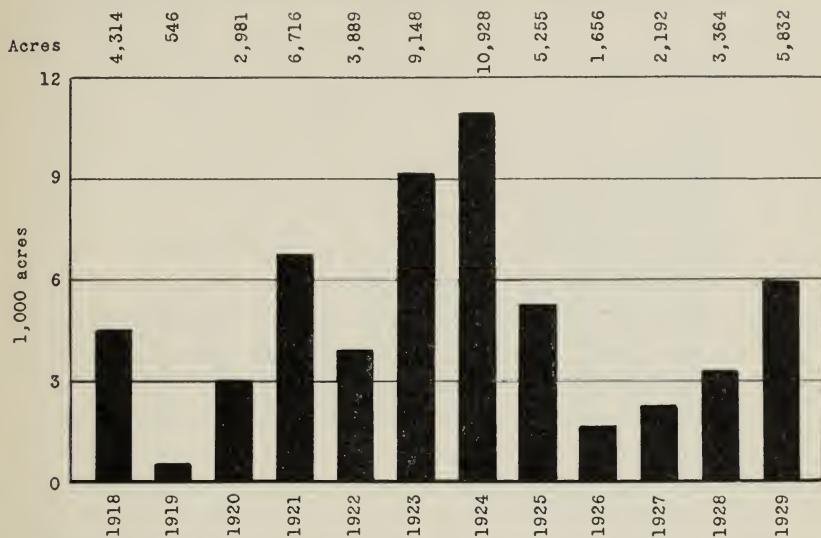


Fig. 4.—Plantings were very heavy during the two years of 1923 and 1924.  
(Data from Cannery League of California.)

AVERAGE RELATION BETWEEN AGE OF ASPARAGUS BEDS AND YIELD PER ACRE IN THE DELTA DISTRICT OF CALIFORNIA

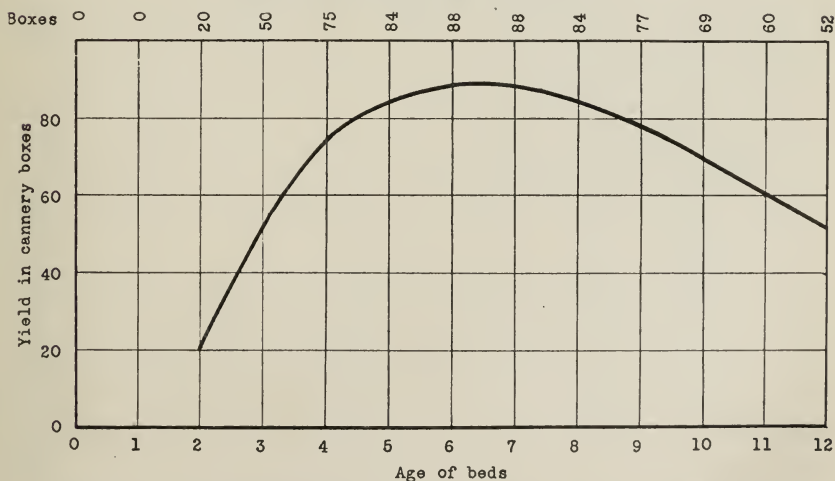


Fig. 5.—An asparagus field in the Delta usually reaches full bearing at six or seven years of age.

(Data calculated from yields on several thousand acres of asparagus in the Delta District of California.)

during the previous two years. The peak of production usually comes in the sixth or seventh year. After the seventh year there is ordinarily a gradual decline. In the twelfth year a bed produces about 52 boxes per acre, approximately the same amount as it does in the third year.

There is, of course, great variation among different fields with respect to yields at various ages. The curve in figure 5 represents the typical situation in the Delta. Many growers have obtained much higher yields than those given here, while others have obtained lower. Some beds reach the peak of production quickly and decline early, others reach their peak later and stay in production longer.

*Trend of Production.*—The total production of asparagus in the Delta for the years 1918–1929 is shown in figure 6. The black portion of the bars represents the production of canning asparagus; the white portion, the production of table asparagus. During the four years 1918–1921 production remained fairly stationary at around 1,250,000 cannery boxes. Then occurred a period of rapid expansion. By 1924 production had reached 2,250,000 boxes and by 1928, 3,800,000 boxes. The average production during the three years of 1927–1929 amounted to 3,500,000 boxes as against an average of 1,250,000 boxes during the four years of 1918–1921, an increase of 2,250,000 boxes or 180 per cent.

That rapid increase in production, however, is not expected to continue during the next few years. The forecast of the trend of production for 1930 and 1931 is shown by the broken line in figure 6. It indicates a period of fairly stationary production as contrasted with the great expansion of recent years. The actual production during the two years may, of course, be above or below the estimated trend, depending largely upon whether yields are above or below normal. With normal yields production during the next two years may be expected to average only about 5 per cent above the average of the past two years.

The forecast of the trend of production was made from data on acreage by age of beds and yields per acre. The accuracy of the forecast may be judged by extending the trend backward for a period of years. The solid line in figure 6 shows the trend of production from 1921 to 1929, estimated on the same basis as the forecast. It will be noted that it corresponds closely to the actual production after allowing for variations in yields per acre from year to year. Most of the differences between the production and the estimated trend in the various years can be accounted for by differences in temperatures during the harvesting season. In 1927 and 1929, for example, the weather was unusually cool, in 1928 it was warmer, and 1926 unusually warm.



PRODUCTION OF ASPARAGUS, DELTA DISTRICT, CALIFORNIA, 1918-1929, AND FORECAST OF TREND OF PRODUCTION, 1930-1931

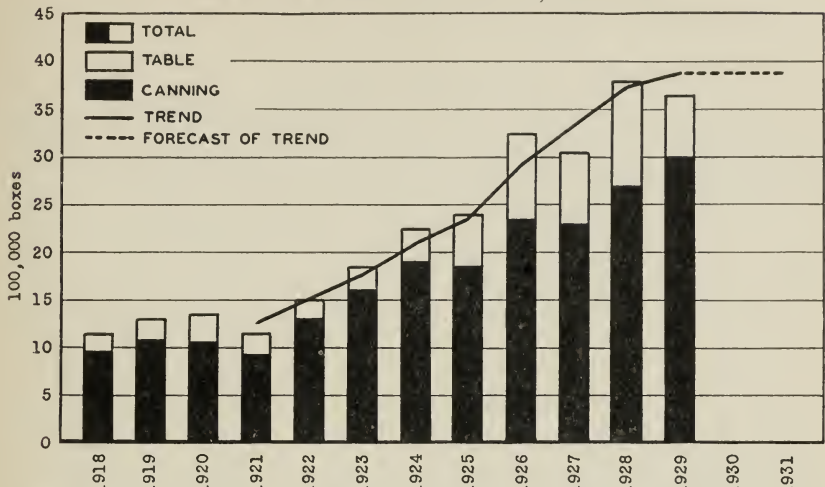


Fig. 6.—There has been a pronounced upward trend in production of asparagus in the Delta during the past eight years, but this rapid increase is not expected to continue during the next two years.

(Data from table 2.)

TABLE 2

ESTIMATED BEARING ACREAGE AND PRODUCTION OF ASPARAGUS, DELTA DISTRICT, CALIFORNIA, 1918-1929, AND FORECAST OF BEARING ACREAGE AND TREND OF PRODUCTION, 1930-1931

Year	Bearing acreage	Production			Trend of production
		Canning	Table	Total	
	1	2	3	4	5
	acres	1,000 boxes*	1,000 boxes*	1,000 boxes*	1,000 boxes*
1918.....	15,000	947	193	1,140	
1919.....	17,000	1,083	227	1,310	
1920.....	18,000	1,076	304	1,380	
1921.....	19,000	931	229	1,160	1,300
1922.....	22,000	1,302	198	1,500	1,500
1923.....	28,000	1,596	254	1,850	1,750
1924.....	31,500	1,882	368	2,250	2,100
1925.....	38,300	1,832	568	2,400	2,360
1926.....	49,000	2,348	892	3,240	2,890
1927.....	51,000	2,299	751	3,050	3,340
1928.....	50,900	2,712	1,088	3,800	3,700
1929.....	51,600	2,995	655	3,650	3,870
1930.....	53,000				3,870
1931.....	55,000				3,870

\*Cannery boxes containing approximately 50 pounds.

Sources of data:

Col. 1. From surveys of private agencies. Forecasts are based on acreage that will normally come into and go out of bearing in 1930 and 1931.

Col. 2. From table 13, column 2.

Col. 3. Includes carlot shipments, estimated express and mixed car shipments and local consumption.

Col. 5. Calculated from data on acreage by age of beds and yields per acre.



## CANNING ASPARAGUS

*Prices Paid to Growers for Canning Asparagus.*—The average prices paid to California growers for No. 1 canning asparagus from 1910 to 1929 are shown by the solid line in figure 7. During the first seven years of the period prices remained at approximately 3 cents a pound. In 1917 prices began to rise and continued upward until 1920. That rise, however, was more than offset by the increase in the prices of commodities that farmers buy for use in living and produc-

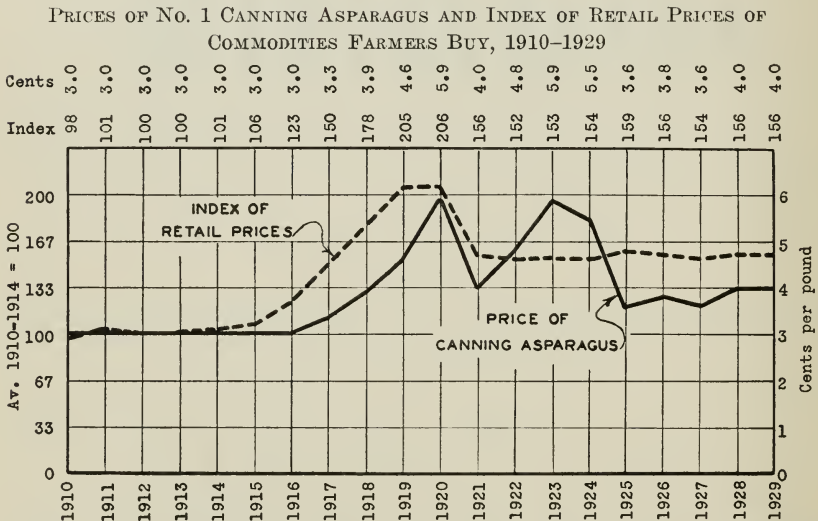


Fig. 7.—As compared with their pre-war levels, prices of canning asparagus were higher than the index of retail prices of commodities farmers buy during the three years 1922-1924, but since 1924 they have been lower.

(Data from table 13.)

tion, which are represented by the broken line. It is recognized, of course, that the general index of prices of commodities that farmers throughout the United States buy, may not adequately represent the costs of producing asparagus, but it is the best index available at the present time. Since 1921 the index of prices of commodities farmers buy has remained fairly stable. As compared with it prices of canning asparagus were high during the three years, 1922-1924, and low during the past four years.

*Relation Between Pack and Price of Canned Asparagus.*—The pack of canned asparagus in California for the years 1910-1929 is shown

by the solid line in figure 8, and the canners' opening prices on Large White in No. 2½ square cans adjusted for changes in the general price level, by the broken line. It will be noted that the upward trend in the pack from 1910 to 1917 was accompanied by a downward trend in prices. Evidently there was little, if any, increase in the demand for canned asparagus during that period. Although consumers were buying more of it at the end of the period than at the beginning, they were doing so only at lower prices.

CANNED PACK OF ASPARAGUS IN CALIFORNIA AND CANNERS' OPENING PRICES (ADJUSTED) ON LARGE WHITE IN NO. 2½ SQUARE TINS, 1910-1929

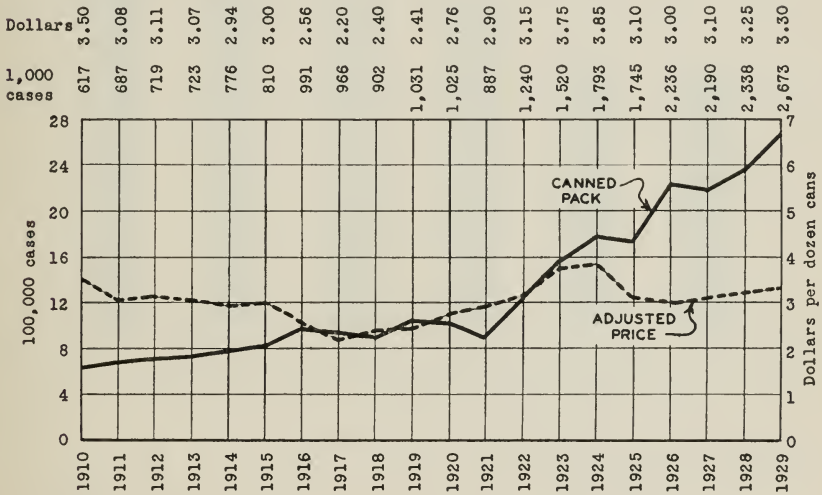


Fig. 8.—During recent years there has been a substantial increase in the demand for canned asparagus.

(Data from table 13.)

Beginning about 1918 the trend of opening prices turned upward and they continued upward until 1924. That upward trend, however, was not the result of a decrease in the supply. In fact, after 1921 there was a pronounced increase. In 1924 the canned pack amounted to 1,793,000 cases as against an average of 961,000 cases in 1918-1921, an increase of 87 per cent. During the same period opening prices advanced 47 per cent. These facts indicate that there was a material increase in the demand for canned asparagus.

Several factors contributed to the increased demand. The buying power of consumers, as indicated by wages and employment, was at a high level. The inclusion of a much larger quantity of fruits and vegetables in the diet and the general tendency toward the increased use of canned goods was reflected in an increased consumption of

## PRODUCTION, CARRYOVER, AND CONSUMPTION OF CANNED ASPARAGUS, 1924-1929

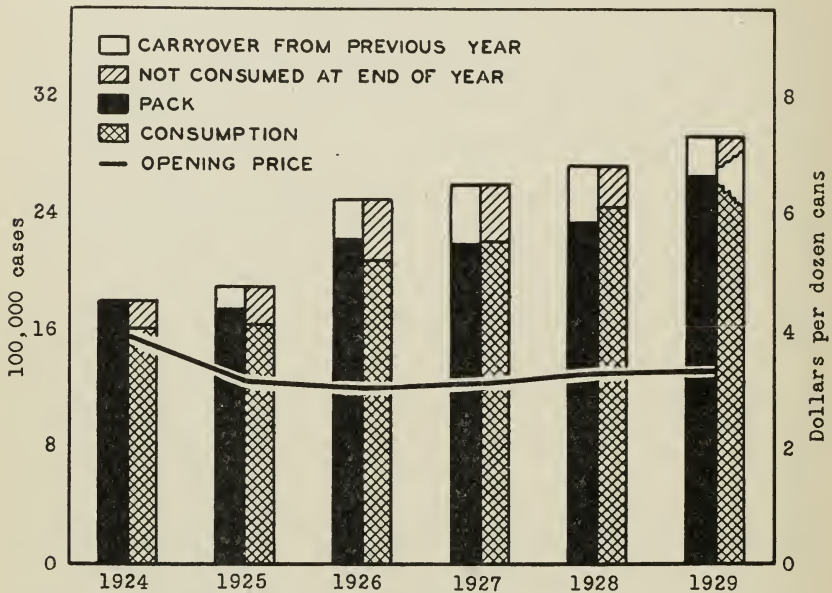


Fig. 9.—The consumption of canned asparagus was almost 50 per cent larger in 1928 than in 1925 despite slightly higher opening prices.

(Data from table 3.)

TABLE 3

## PRODUCTION, CARRYOVER, AND CONSUMPTION OF CANNED ASPARAGUS, 1924-1929

Year	Pack	Carryover* from pre- vious year	Available for con- sumption	Carryover* into follow- ing year	Con- sumption
	<i>1,000 cases</i>	<i>1,000 cases</i>	<i>1,000 cases</i>	<i>1,000 cases</i>	<i>1,000 cases</i>
1924.....	1,793		1,793	170	1,623
1925.....	1,745	170	1,915	251	1,664
1926.....	2,236	251	2,487	406	2,081
1927.....	2,190	406	2,596	402	2,194
1928.....	2,338	402	2,740	269	2,471
1929.....	2,673	269	2,942		

\* Carryover figures include total stock on hand as of March 1.

Source of data: Cannery League of California.

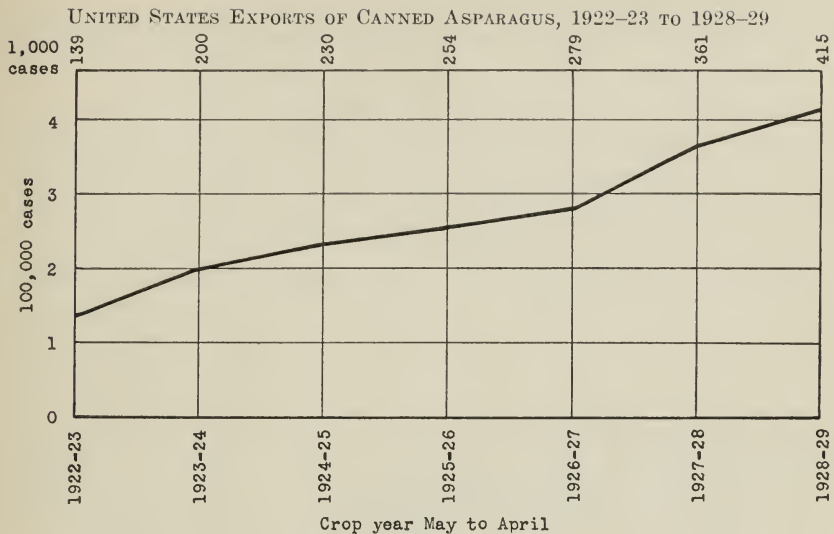


Fig. 10.—There has been a steady upward trend in the exports of canned asparagus.

(Data from table 14.)

TABLE 4

UNITED STATES EXPORTS OF CANNED ASPARAGUS BY COUNTRIES OF DESTINATION  
ANNUAL 1922-1927, AND AVERAGE 1923-1927

Country	Calendar years						Average 1923-1927
	1922	1923	1924	1925	1926	1927	
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
Australia.....	26,459	29,163	31,330	39,662	51,511	55,188	41,371
United Kingdom.....	14,246	26,751	42,577	29,719	29,858	45,136	34,808
Canada.....	10,334	19,243	17,663	14,979	22,667	35,550	22,020
Japan.....	21,629	16,811	26,448	9,436	22,958	19,301	18,991
France.....	7,050	22,740	10,715	18,475	13,700	18,963	16,919
China.....	11,821	11,236	8,207	16,165	12,505	10,266	11,676
Switzerland.....	1,068	4,562	5,070	9,112	10,964	13,666	8,675
British South Africa.....	3,067	5,973	4,572	6,102	9,680	14,229	8,111
Cuba.....	2,986	7,780	8,584	6,418	5,121	4,455	6,472
Netherlands.....	1,683	2,058	3,527	6,180	9,100	10,936	6,360
Belgium.....	745	1,176	7,793	6,941	9,039	6,282	6,246
Mexico.....	4,687	5,538	6,414	6,007	8,383	3,111	5,891
British India.....	6,779	4,124	4,984	7,295	5,199	6,680	5,656
Sweden.....	570	899	2,613	2,607	4,969	6,778	3,573
Java and Madura.....	3,802	4,039	2,581	2,773	4,613	2,911	3,383
Denmark.....	370	793	638	1,711	6,075	4,790	2,801
Others.....	21,152	31,923	36,721	55,880	46,760	83,176	50,892
Total.....	138,448	194,809	220,437	239,462	273,102	341,418	253,845

Source of data: U. S. Dept. Commerce. Foreign Commerce and Navigation of the United States, annual numbers. Data, which were given in pounds, were converted to cases on the basis of 45 pounds to the case.

canned asparagus. About 1919 the canning of asparagus in picnic tins began. These tins contain sufficient asparagus for a small family and sell for about one-half as much as the large ones.

Although data on carryover are not available before 1924 the consensus of opinion in the trade is that the carryover was negligible during the immediately preceding years. However, with a pack 273,000 cases larger in 1924 than in 1923 and with slightly higher opening prices, about 170,000 cases of the 1924 pack were carried over into the 1925 season. As a result a drastic downward readjustment in prices was made. The opening price in 1925 was \$3.10 a dozen as against \$3.85 a dozen in 1924. The situation during the past six years is illustrated in figure 9, in which data on carryover are included. The black portion of the bars represents the pack, the white portion the carryover from the previous year's pack, the single cross-hatched portion, the quantity in the hands of the canners at the end of the year, the double crosshatched portion the estimated consumption, and the black line the canners' opening prices.

The consumption of canned asparagus was only slightly larger in 1925 than in 1924. It is probable that the decline in the canners' opening prices in 1925 was not reflected in a corresponding decline in prices to consumers until several months later, and that consumers did not respond promptly to the lower prices when they did occur. In 1926, however, consumption was about 25 per cent larger than in 1925. The low level of prices had by that time prevailed for a considerable period. In addition, the Canners' League of California started an extensive advertising campaign. In 1927 and 1928 the increase in consumption continued, although at a somewhat slower rate, despite small advances in opening prices.

During the past two years the canning of green asparagus has become of some importance. Sufficient information, however, is not yet available to determine how successful the product may become and what effect it will have upon the industry.

*Exports of Canned Asparagus.*—The United States exports of canned asparagus from 1922–23 to 1928–29 are shown in figure 10. During that period there has been a steady upward trend in exports. Each year exports were larger than in the preceding year. The increase from 1922–23 to 1928–29 amounted to approximately 276,000 cases, or almost 200 per cent.

There has been not only a large absolute increase in exports but also a substantial increase in the proportion of the canned pack



exported. An average of 11.7 per cent of the canned packs of 1922 and 1923 were exported as against an average of 17.1 per cent of the packs of 1927 and 1928.

Our principal foreign markets for canned asparagus are given in table 4. During the five years 1923–1927 the sixteen countries listed separately have taken about 80 per cent of our total exports. Australia has been our most important foreign market, followed by the United Kingdom, Canada, Japan, France, and China, in the order named. Those six countries have received approximately 58 per cent of our total exports, while Australia alone has received over 16 per cent.

UNITED STATES PRODUCTION OF TABLE ASPARAGUS BY STATES, AVERAGE 1925–1928

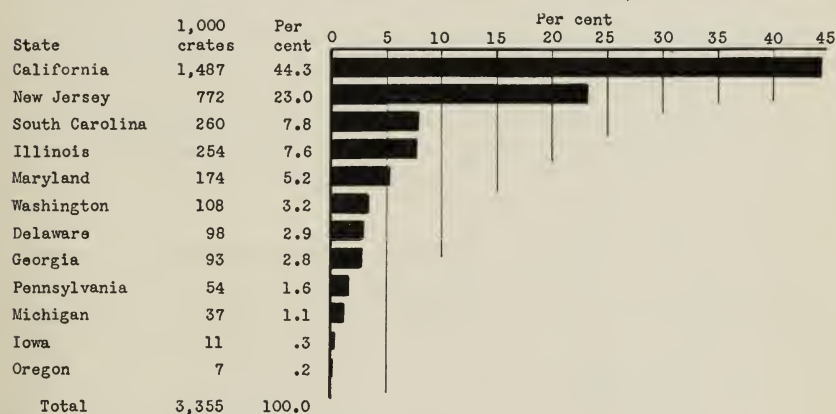


Fig. 11.—In addition to practically all of the canning asparagus, California produces almost 45 per cent of the table asparagus grown in the United States.

(Data compiled from U. S. Dept. Agr. Yearbook of Agriculture 1928:789. 1929.)

#### TABLE ASPARAGUS

*Important Table-Asparagus-producing States.*—The relative importance of the several states from the standpoint of production of table asparagus is shown in figure 11. The five states most important in the production of table asparagus are California, New Jersey, South Carolina, Illinois, and Maryland. During the four years, 1925–1928, these five states produced 87.9 per cent of the total commercial crop, while California alone produced 44.3 per cent.

*Seasonal Variation in Carlot Shipments.*—Table asparagus moves to market in carlots during a period of about four months, March to June inclusive. The 1925–1929 average weekly carlot shipments

from the United States, expressed in percentages of the total for the season, are shown by the solid line in figure 12. This line represents the typical seasonal movement. Shipments in carlots usually begin around the first of March. They increase rapidly during March and reach a peak around the first of April. During the last week in March and the first three weeks in April shipments are generally the heaviest. On the average 50 per cent of the total has been shipped during these four weeks. After the first week in April shipments gradually decline. By the end of May over 90 per cent of the total crop has been shipped and by the end of June the shipping season is practically finished. The seasonal movement varies, of course, from year to year depending largely upon weather conditions.

The general extent and periods of competition between the different sections of the United States producing table asparagus are shown in figures 13 and 14. It takes about a week longer to ship asparagus from the Pacific Coast to the principal markets in the east than from such states as South Carolina and Georgia. In order, therefore, to show accurately the competition that California asparagus experiences in those markets, shipments from the states east of the Mississippi River were lagged one week.

In figure 13 the black portions of the bars represent the weekly carlot shipments from California, the white portions, the combined shipments from the other asparagus-producing states. Because California produces so large a proportion of the total crop, shipments from this state closely parallel those of the United States. A limited quantity of asparagus is shipped from California in less than carlots during February, but shipments in carlots do not begin until about the first of March. During the next four or five weeks they increase rapidly, reaching a peak usually about the first or second week in April, but after that they decline. On the average about 80 per cent of the total carlot shipments have been sent to market by the end of April, and about 94 per cent by the end of May.

California is the earliest asparagus-shipping state. In some years, such as in 1928, a considerable proportion of our crop reaches the eastern markets before heavy shipments from the other states begin to arrive there. In other years, such as 1929, we meet with keen competition from almost the beginning of the season. From the standpoint of competition between California and other states 1924 and 1926 were similar to 1928; 1925 and 1927 were similar to 1929.

PERCENTAGE OF UNITED STATES CARLOT SHIPMENTS OF ASPARAGUS SHIPPED BY WEEKS, AVERAGE 1925-1929

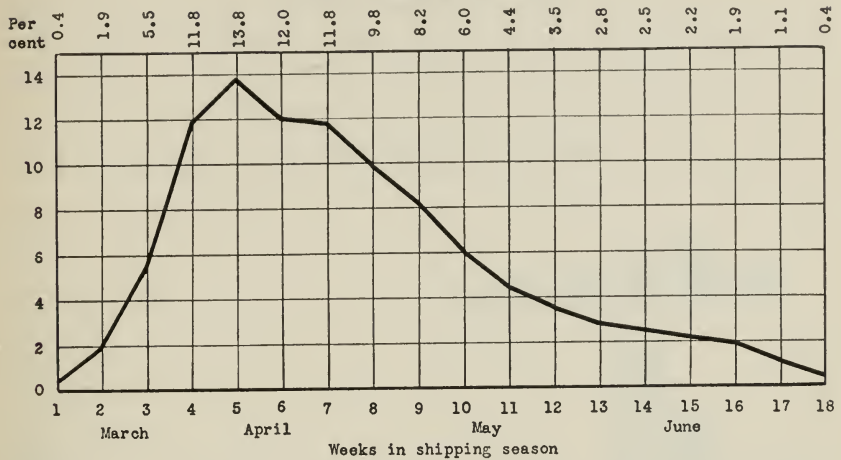


Fig. 12.—The United States carlot shipments of asparagus are usually the heaviest during the last week in March and the first three weeks in April.

(Data computed from table 15.)

WEEKLY CARLOT SHIPMENTS OF ASPARAGUS, CALIFORNIA AND OTHER STATES, 1928-1929

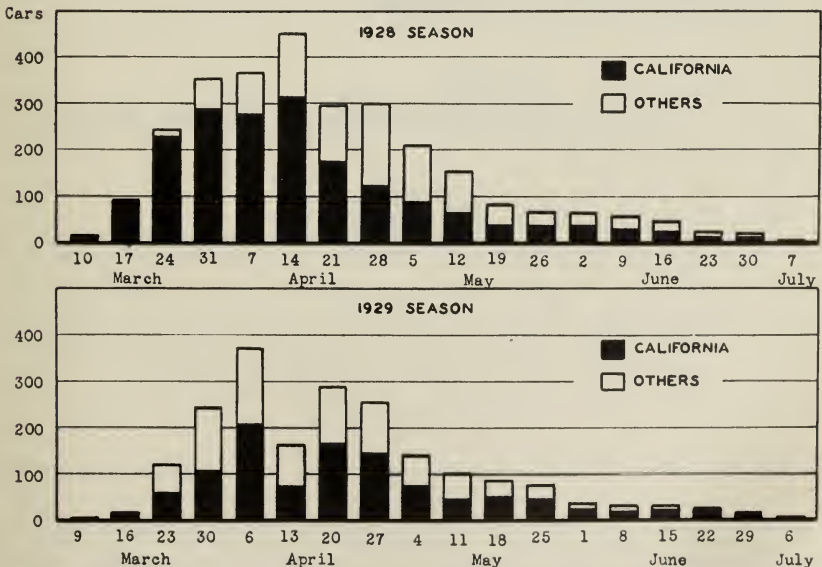


Fig. 13.—California asparagus meets with considerable competition in the eastern markets from that grown in other states.

(Data from table 16. Shipments from all states except California, Oregon, and Washington were lagged one week.)

Figure 14 shows the weekly carlot shipments of asparagus from Georgia, South Carolina, Illinois, and Washington during 1929. In that year the shipments from these four states constituted 93 per cent of the total shipments included in "others" in figure 13. New Jersey is the most important of the asparagus-producing states, other than

WEEKLY CARLOT SHIPMENTS OF ASPARAGUS FROM GEORGIA, SOUTH CAROLINA, ILLINOIS, AND WASHINGTON, 1929

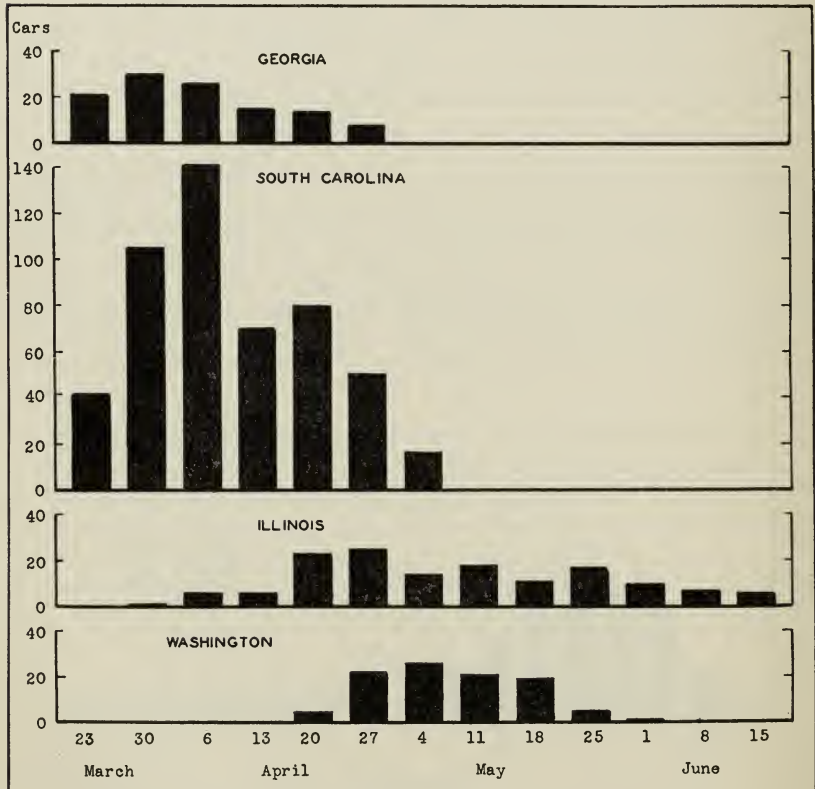


Fig. 14.—Shipments from Georgia and South Carolina compete most severely with those from California in the eastern markets.

(Data from table 16. Shipments from Georgia, South Carolina, and Illinois were lagged one week.)

California, that are not included in figure 14. The largest proportion of the New Jersey asparagus now moves to market by truck. Consequently, carlot shipments are not a reliable index of production in that state. The shipping season in New Jersey corresponds fairly closely to that in Illinois. A comparison of figures 13 and 14 shows that during the peak of our season South Carolina and Georgia are our most severe competitors in the eastern markets.

The general competitive situation is also shown by the monthly carlot shipments by states of origin, table 5, and the monthly unloads at New York City by states of origin, table 9.

TABLE 5  
UNITED STATES CARLOT SHIPMENTS OF ASPARAGUS BY MONTHS AND STATES,  
1927-1929

States	March	April	May	June	July	Oct.	Nov.	Total
	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>
<b>1927</b>								
California.....	188	636	204	118	1	6	1	1,154
South Carolina.....	104	280	63					447
Georgia.....	47	64						111
Washington.....		20	61	12				93
New Jersey.....			102	52	2			156
Illinois.....		19	94	43	2			158
Others.....		3	10		1			14
Total.....	339	1,022	534	225	6	6	1	2,133
<b>1928</b>								
California.....	624	913	220	84	3	24	8	1,876
South Carolina.....	1	297	165					463
Georgia.....	13	122	23					158
Washington.....		54	66	7				127
New Jersey.....			15	18	1			34
Illinois.....		2	131	72	8			213
Others.....		2	5					7
Total.....	638	1,390	625	181	12	24	8	2,878
<b>1929*</b>								
California.....	294	606	202	86				
South Carolina.....	43	407	47					
Georgia.....	22	87						
Washington.....		41	57					
New Jersey.....			22					
Illinois.....		51	68	25				
Others.....		14	24	14				
Total.....	269	1,206	420	125				

\* Subject to revision.

Source of data: U. S. Dept. Agr., Bur. Agr. Econ., mimeographed reports.

The carlot shipments by months and districts in California for the years 1926-1929 are given in table 6. Almost all of the shipments from the northern and central districts originate in the Delta. That section and the Imperial Valley start shipping at about the same time.



Shipments in carlots from the Imperial Valley extend for a period of about two months, and from the Delta for a period of about four months. Shipments from the Delta during May and June, however, are much lighter than during the previous May months. The canning season in the Delta usually opens the first of April or shortly thereafter. Most of the contracts between growers and canners specify the

TABLE 6  
MONTHLY CARLOT SHIPMENTS OF ASPARAGUS BY DISTRICTS IN CALIFORNIA  
1927-1929

District	March	April	May	June	July	Oct.	Nov.	Total
	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>
<b>1927</b>								
Northern*.....	81	312	73	48				514
Central*.....	74	270	130	70	1			545
Southern.....		5	1					6
Imperial Valley.....	33	49				6	1	89
Total.....	188	636	204	118	1	6	1	1,154
<b>1928</b>								
Northern*.....	324	556	148	69	3			1,100
Central*.....	235	270	71	15				591
Southern.....	1	6	1					8
Imperial Valley.....	64	81				24	8	177
Total.....	624	913	220	84	3	24	8	1,876
<b>1929†</b>								
Northern*.....	69	280	112	50				
Central*.....	98	236	89	36				
Southern.....		8	1					
Imperial Valley.....	37	82						
Total.....	204	606	202	86				

\* Most of the shipments from the northern and central districts originate in the Delta.

† Subject to revision.

Source of data: U. S. Dept. Agr., Bur. Agr. Econ., mimeographed reports.

delivery of the entire crop throughout the canning season, although some growers ship fresh asparagus for a time after the opening of the canneries. In addition a considerable acreage, particularly that which produces small asparagus, is cut green during the entire season. That acreage produces most of the asparagus that is shipped from the Delta for table consumption after the middle of April. In 1929 it was estimated that around 3,200 acres were cut green all season.

In addition to the spring crop in the Imperial Valley, a fall crop has been developed during recent years. In 1928, for example, 24 cars were shipped in October and 8 cars in November.

*Trend of Carlot Shipments.*—The annual carlot shipments of asparagus in the United States from 1917 to 1929 are shown by the solid line in figure 15. From 1917 to 1920 there was a small upward trend in shipments. In 1921 this upward trend was interrupted, and for

ANNUAL CARLOT SHIPMENTS OF ASPARAGUS, UNITED STATES, 1917-1929

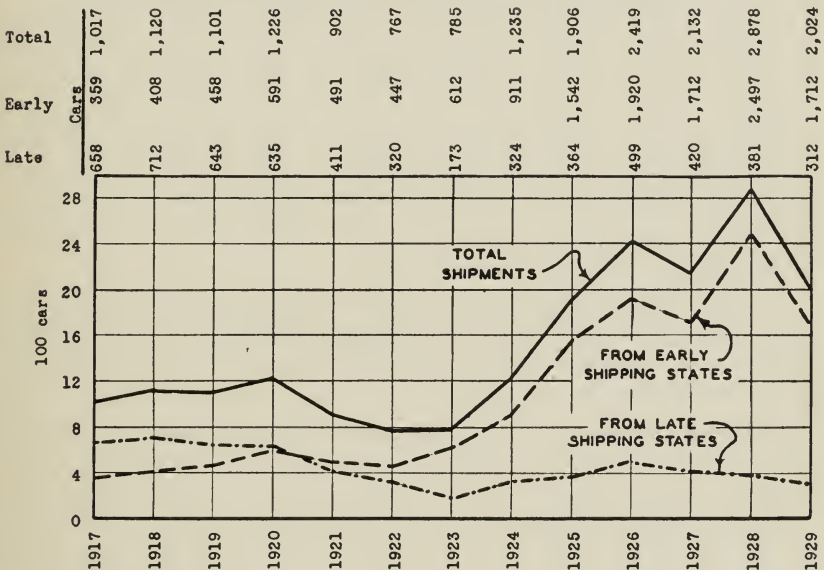


Fig. 15.—During the past six years there has been a very large increase in carlot shipments of asparagus, practically all of which has occurred in the early-shipping states of California, South Carolina, and Georgia.

(Data from table 7.)

the three years 1921, 1922, and 1923 shipments were low. Since 1923 there has been a rapid increase in shipments. During the three years of 1927-1929 they averaged 2,345 cars a year as against an average of 818 cars from 1921 to 1923, and an average of 1,079 cars from 1917 to 1919.

All of the increase in carlot shipments from 1917-1919 to 1927-1929 occurred in the early-shipping states of California, South Carolina, and Georgia. Those three states contributed 84 per cent of the total United States shipments in 1927-1929 as against 38 per cent in 1917-1919. In the late-shipping states there has been an absolute as well as a relative decrease in carlot shipments. The combined shipments from those states averaged 671 cars annually in 1917-1919 as

against an average of 371 cars annually in 1927–1929. All of that decline, however, occurred in New Jersey and reflects the increase in truck shipments and not a decrease in production. The trend of shipments from Illinois and Washington, the other two most important late-shipping states, has been upward, table 7.

In figure 16 the carlot shipments of asparagus from California are represented by the black portion of the bars, those from South Carolina by the shaded portion, and those from Georgia by the white portion. Approximately 69 per cent of the increase of 1,457 cars in the carlot shipments of early asparagus from 1921–1923 to 1927–1929 were from California, 22 per cent from South Carolina and 9 per cent from Georgia. Georgia has only recently become an important asparagus-shipping state. In 1924 only 8 cars were shipped from that state; during the past three years shipments have averaged 128 cars annually. From 1921–1923 to 1927–1929 shipments from South Carolina increased from 142 cars to 468 cars, while shipments from California increased from 375 cars to 1,377 cars.

In 1929 carlot shipments from California were smaller than in any year since 1924. Although the bearing capacity of the fields was larger than ever before, the yields were materially reduced as a result of the unusually low temperatures in the Delta just before and during the harvesting season. Not only did the low temperatures delay the start of cutting, thus shortening the length of the harvesting period, but they also diminished the average quantity obtained from the various cuttings. If weather conditions had been normal in 1929, carlot shipments would have been fully as large as in 1928 when they amounted to 1,876 cars.

As contrasted with the period from 1923 to 1929, it is not expected that there will be a further marked upward trend in carlot shipments from this state within the next two or three years. The peak of bearing capacity of the present acreage has apparently been reached, and no further material increase in bearing acreage is in prospect in the immediate future. On the other hand, a further increase in the trend of shipments from both South Carolina and Georgia may be expected. Although data by age of beds are not available in these states, the relatively large increase in total acreage during recent years indicates that a considerable proportion of the present acreage has not yet come into full bearing. In South Carolina the total acreage, which amounted to 4,500 acres in 1925, increased to 5,300 acres in 1926 and to 7,000 acres in 1928, while in Georgia it rose from 2,820 acres in 1925 to 4,380 acres in 1926, and to 5,640 acres in 1928. These increases in total acreage, however, have not yet resulted in corresponding

TABLE 7

UNITED STATES CARLOT SHIPMENTS OF ASPARAGUS, BY STATES OF ORIGIN, 1917-1929

Year	Early-shipping states				Late-shipping states					Grand total
	California	South Carolina	Georgia	Total	Illinois	New Jersey	Washington	Others	Total	
	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>
1917	265	94	.....	359	49	601	3	5	658	1,017
1918	303	105	.....	408	21	674	3	12	712	1,120
1919	377	81	.....	458	79	564	.....	.....	643	1,101
1920	502	89	.....	591	164	465	1	5	635	1,226
1921	362	129	.....	491	170	237	2	2	411	902
1922	304	143	.....	447	161	154	5	.....	320	767
1923	458	154	.....	612	93	64	10	6	173	785
1924	718	185	8	911	157	156	10	1	324	1,235
1925	1,279	263	.....	1,542	165	150	31	18	364	1,906
1926	1,503	364	53	1,920	144	226	111	18	499	2,419
1927	1,154	447	111	1,712	158	156	93	13	420	2,132
1928	1,876	463	158	2,497	213	34	127	7	381	2,878
1929*	1,102	496	114	1,712	144	33	99	36	312	2,024

\* Subject to revision.

Sources of data: Years 1917-1919. U. S. Dept. Agr., Weather Crops and Markets, 3: 11: 231. 1923. Years 1920-1928. U. S. Dept. Agr., Yearbook of Agriculture, 1928: 790. Year 1929, U. S. Dept. Agr., Bur. Agr. Econ., Weekly Summary of Carlot Shipments of Fruits and Vegetables, except shipments for Georgia, which are from B. C. Boree, Specialist in Market News, Bur. Agr. Econ., U. S. Dept. Agr.

ANNUAL CARLOT SHIPMENTS OF ASPARAGUS FROM EARLY-SHIPPING STATES, 1917-1929

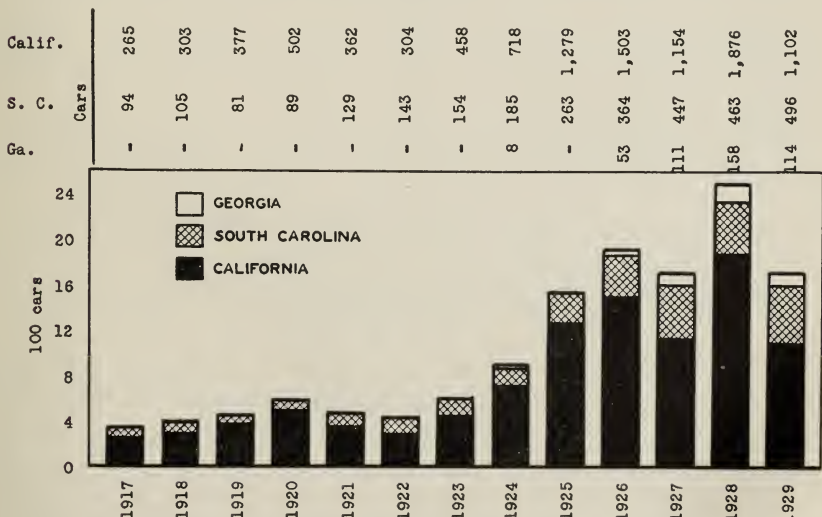


Fig. 16.—Between 1921-1923 and 1927-1929 California contributed 69 per cent of the total increase in carlot shipments from the early-shipping states, while South Carolina contributed 22 per cent and Georgia 9 per cent.

(Data from table 7.)



increases in production since an asparagus field is not ordinarily cut before two years of age and does not produce a full crop until several years later.

*Unloads in Important Markets.*—The monthly carlot unloads of California asparagus in ten important markets of the United States

TABLE 8  
CARLOT UNLOADS OF CALIFORNIA ASPARAGUS IN CITIES BY MONTHS, 1927-1928

City	March	April	May	June	July	Total
<b>1927</b>						
New York.....	52	304	47			403
Los Angeles.....	26	158	192	132	3	511
San Francisco*.....	30	158	94	50	2	334
Philadelphia.....	2	70	3			75
Boston.....		25	1			26
Portland.....	1	18	3			22
Pittsburgh.....	2	7	4			13
Denver.....		8				8
Salt Lake City.....		1				1
Cincinnati.....		4				4
<b>Total.....</b>	<b>113</b>	<b>753</b>	<b>344</b>	<b>182</b>	<b>5</b>	<b>1,397</b>
<b>1928</b>						
New York.....	149	434	62			645
Los Angeles.....	74	210	177	85	6	554
San Francisco*.....	108	155	91	55	11	420
Philadelphia.....	40	141	9			190
Boston.....	10	79	6			95
Portland.....	8	31	1			40
Pittsburgh.....	3	25	2			30
Denver.....	3	17	3			23
Salt Lake City.....		8				8
Cincinnati.....		7				7
<b>Total.....</b>	<b>395</b>	<b>1,107</b>	<b>351</b>	<b>140</b>	<b>17</b>	<b>2,012</b>

\* Includes estimated truck receipts.

Source of data: Hansen, C. J., and O. W. Holmes, Marketing California asparagus. Annual summaries. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed reports.

during 1927 and 1928 are shown in table 8. Our most important markets are New York, Los Angeles, and San Francisco. In 1928 these three cities received 80 per cent of the 2,012 cars unloaded in the ten cities listed in table 8. In addition to the carlot unloads at Los Angeles, a considerable quantity is received by truck. Most of the asparagus grown in Riverside, Los Angeles, and Orange counties is consumed locally.

During March and April the larger proportion of California shipments goes to the eastern markets. In 1928 about 59 per cent of the



unloads listed during March and April were in New York, Philadelphia, Boston, and Pittsburg, and only 36 per cent in San Francisco and Los Angeles. In May, however, only 23 per cent were in the four eastern markets while 76 per cent were in the two California cities, and

TABLE 9

CARLOT UNLOADS OF ASPARAGUS AT NEW YORK, BY MONTHS AND STATES OF ORIGIN, 1927 AND 1928

State	March	April	May	June	July	Total
<b>1927</b>						
California .....	52	304	47			403
South Carolina .....	44	90	41			175
New Jersey .....		2	96	68	12	178
Washington.....			2			2
Delaware.....		1	8	1		10
Maryland.....			6	1		7
Georgia.....		4	1			5
Total .....	96	401	201	70	12	780
<b>1928</b>						
California .....	149	434	62			645
South Carolina .....		87	100			187
New Jersey .....			41	41	5	87
Washington.....			9			9
Delaware.....			3	1		4
Maryland.....			1			1
Georgia.....		3	2			5
Oregon.....			1			1
Total .....	149	524	219	42	5	939

Source of data: Hansen, C. J., and O. W. Holmes. Marketing California asparagus. Annual summaries. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed reports.

in June no unloads from California were reported in markets outside of the state. After about the middle of April there is usually a decline in the proportion of California shipments that goes to eastern markets and an increase in the proportion to markets within the state. That situation is largely the result of the increase in the supplies in the eastern markets from the nearby-producing states.

The extent of the competition from other states that California asparagus experienced in the New York market during the 1927 and 1928 seasons is shown in table 9. It will be noted that the competition during March and April was considerably greater in 1927 than in 1928. In the latter year carlot shipments from South Carolina did not appear in the New York market until April, while in 1927 relatively heavy shipments were received in March. It will also be noted that the

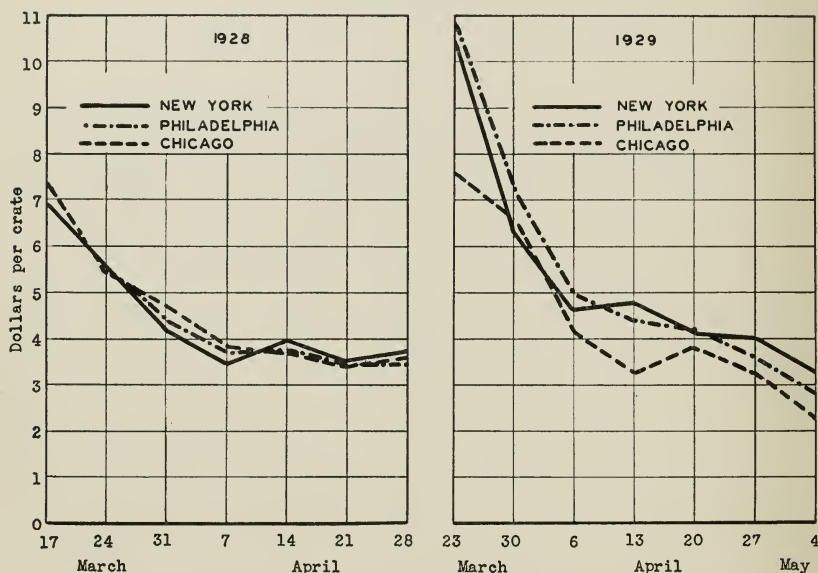
WEEKLY AVERAGE JOBBING PRICES OF CALIFORNIA ASPARAGUS AT THREE MARKETS,  
1928-1929

Fig. 17.—Prices of California asparagus in the eastern markets tend to move together.

(Data from table 10.)

TABLE 10

WEEKLY AVERAGE JOBBING PRICES PER CRATE\* OF CALIFORNIA ASPARAGUS AT  
NEW YORK, PHILADELPHIA, AND CHICAGO, 1928-1929

Week ending	1928			Week ending	1929		
	New York	Philadelphia	Chicago		New York	Philadelphia	Chicago
Mar. 17.....	<i>dollars</i> 6.90	<i>dollars</i> 6.90	<i>dollars</i> 7.40	Mar. 23.....	<i>dollars</i> 10.55	<i>dollars</i> 11.00	<i>dollars</i> 7.60
24.....	5.55	5.55	5.40	30.....	6.25	7.25	6.60
31.....	4.15	4.35	4.70	Apr. 6.....	4.60	4.95	4.10
Apr. 7.....	3.45	3.70	3.80	13.....	4.75	4.35	3.25
14.....	3.95	3.75	3.70	20.....	4.10	4.20	3.80
21.....	3.50	3.45	3.40	27.....	4.00	3.60	3.25
28.....	3.70	3.45	3.55	May 4.....	3.25	2.80	2.25

\* California pyramidal crate containing one dozen bunches, each weighing approximately 2½ pounds.

Sources of data: Hansen, C. J., and O. W. Holmes. Marketing California asparagus. Annual summaries. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed reports.

Weekly prices are derived from the simple average of the daily range of selling prices of each grade, weighted as follows: very large 8, large 24, medium 40, and small 28.

combined receipts from the states other than California are usually the heaviest in May, whereas those from California are heaviest in April.

*Close Relation Between Prices in Eastern Markets.*—Prices of asparagus in the principal eastern markets tend to keep rather closely in line. Figure 17 shows the weekly average prices of California

AVERAGE JOBBING PRICES OF CALIFORNIA ASPARAGUS AND TOTAL CARLOT RECEIPTS AT NEW YORK, BY WEEKS, 1924-1929

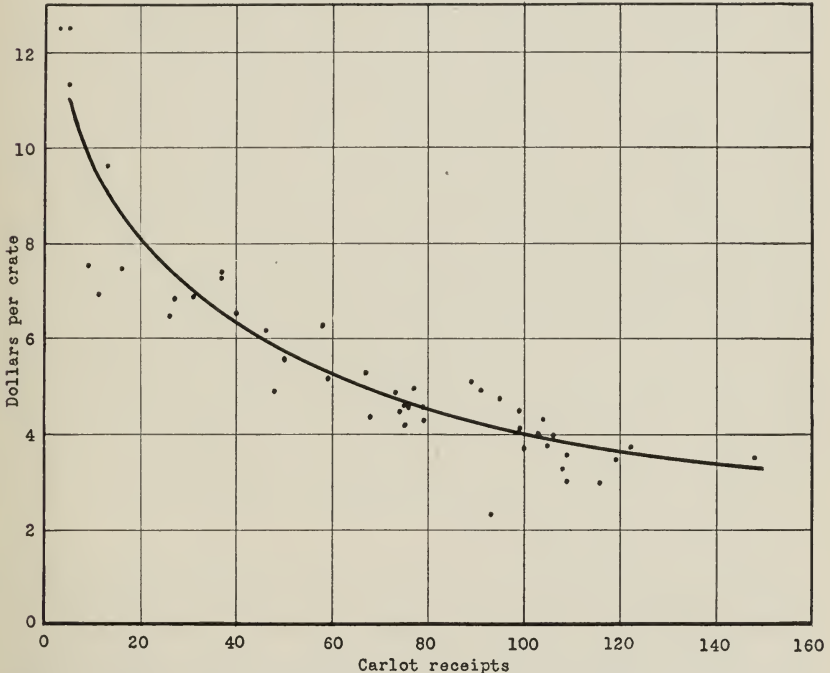


Fig. 18.—Light receipts of asparagus at New York are generally accompanied by high prices, heavy receipts by low prices.  
(Data from table 11.)

asparagus at New York, Philadelphia, and Chicago during the 1928 and 1929 marketing seasons. While prices in the several markets did not always move in the same direction or to the same extent there was, nevertheless, a strong tendency toward the same general movement. An analysis of the figures for earlier years reveals the same tendency.

*Relation Between Weekly Average Prices and Receipts at New York.*—The changes in prices from week to week in the various markets are caused in the main by changes in the supply of asparagus in those markets. In figure 18 the weekly carlot receipts of asparagus at New York during March and April are measured on the horizontal scale and the average weekly prices on the vertical scale. Each dot

represents the receipts and average price for a given week. The solid curve represents the average relationship that has existed between receipts and prices during the past six years.

During the early part of the season, when supplies are light, prices are very high. It is not unusual for the first few express shipments to sell for \$15.00 or more a crate. As soon as supplies become heavier, however, prices drop rapidly. When carlot receipts at New York City were around 10 cars a week prices averaged about \$10.00 a crate. When they rose to 20 cars a week prices declined to \$8.00 a crate, and when they reached 100 cars a week prices averaged only \$4.00 a crate.

If the weekly carlot receipts were the only factor that affected the weekly price, all of the dots in figure 18 would be located in the position occupied by the solid curve. The fact that they are not indicates that other factors also influence the changes in prices from week to week. Among those factors are the quality and size of asparagus and the supply of competing vegetables. On the average, however, they have been much less important than the supply of asparagus. During the six years 1924–1929 an average of 88 per cent of the changes in the weekly jobbing prices of California asparagus at New York can be accounted for by the receipts of asparagus. This leaves only 12 per cent to be explained by all other factors combined. The analysis covers a period of eight weeks, beginning about the second week in March, in each of the six years mentioned. About 90 per cent of the total receipts of California asparagus at New York arrive during those eight weeks.

*Seasonal Variation in Prices at San Francisco.*—The average seasonal variation in the jobbing prices of asparagus at San Francisco for the past five years is shown in figure 19. Prices are usually very high at the beginning of the season because of the limited supply. The first few receipts, which generally arrive the latter part of February, frequently sell for 40 or 50 cents a pound. As supplies increase prices fall. During the first week in March, when shipments in carlots usually start, prices average around 25 cents a pound, but by the first or second week in April when the peak of shipments is usually reached, they average only 7 or 8 cents a pound. From then until the end of the season prices fluctuate around 6 or 7 cents a pound. The increase in the supply of competing products slightly more than offsets the decrease in the supply of asparagus.

From the middle of April to the end of the season receipts of asparagus at the markets within the state do not decline as rapidly as carlot shipments. In 1928, for example, carlot shipments were 80

TABLE 11  
AVERAGE JOBBING PRICES PER CRATE OF CALIFORNIA ASPARAGUS AND TOTAL  
CARLOT RECEIPTS AT NEW YORK, BY WEEKS, 1924-1929

Weeks of season*	1924		1925		1926		1927		1928		1929	
	Re-ceipts	Price	Re-ceipts	Price	Re-ceipts	Price	Re-ceipts	Price	Re-ceipts	Price	Re-ceipts	Price
	<i>cars</i>	<i>dollars</i>	<i>cars</i>	<i>dollars</i>	<i>cars</i>	<i>dollars</i>	<i>cars</i>	<i>dollars</i>	<i>cars</i>	<i>dollars</i>	<i>cars</i>	<i>dollars</i>
1.....	13	9 60	9	7 50	5	11 30	5	12 50	11	6 90	3	12 50
2.....	26	6 45	13	9 05	16	7 45	37	7 25	50	5 55	6	10 55
3.....	27	6 80	46	6 15	48	4 85	59	5 15	75	4 15	58	6 25
4.....	31	6 85	68	4 35	79	4 55	74	4 45	119	3 45	75	4 60
5.....	40	6 50	104	4 30	105	3 75	79	4 25	106	3 95	95	4 75
6.....	67	5 25	116	2 95	109	3 55	100	3 70	148	3 50	99	4 10
7.....	73	4 85	109	3 00	91	4 90	99	4 50	122	3 70	103	4 00
8.....	37	7 35	93	2 30	89	5 10	76	4 55	77	4 95	108	3 25
Total or average.....	314	6 15	558	3 75	542	4 50	529	4 65	708	4 00	547	4 45

\* Beginning weeks: 1924, Mar. 15; 1925, Mar. 14; 1926, Mar. 13; 1927, Mar. 19; 1928, Mar. 17; 1929, Mar. 16.

Sources of data: Year 1924, Producers' Price-Current. Years 1925-1928, Hansen, C. J., and O. W. Holmes. Marketing California asparagus. Annual summaries. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed reports—except receipts, 1926, and prices, week ending March 13, 1926, which are from Producers' Price-Current. Year 1929, U. S. Dept. Agr. Bur. Agr. Econ. Daily Market Reports—except for week ending March 16, which is from New York Daily Fruit Reporter.

Weekly prices are simple averages of daily selling prices of each grade. In averaging the prices of each grade for the week the following weights were used: very large 8, large 24, medium 40, and small 28.

Average prices for the season were obtained by weighting the weekly prices by the carlot receipts.

WEEKLY JOBBING PRICES OF WHITE GRADED ASPARAGUS AT SAN FRANCISCO,  
AVERAGE 1925-1929

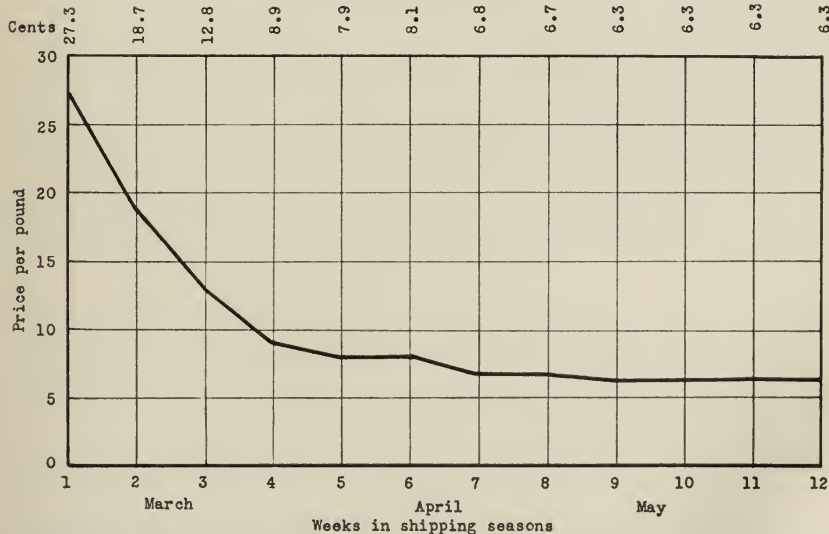


Fig. 19.—There is usually a pronounced fall in asparagus prices during the first four weeks of the shipping season.

(Data from table 17.)



per cent smaller in May than in April, whereas total receipts at San Francisco were only 41 per cent smaller and carlot receipts at Los Angeles only 16 per cent smaller.

*Relation Between Annual Prices and Carlot Shipments.*—In figure 20 the annual carlot shipments from California, South Carolina, and

ANNUAL AVERAGE JOBBING PRICES OF CALIFORNIA ASPARAGUS AT NEW YORK AND SAN FRANCISCO, AND TOTAL CARLOT SHIPMENTS FROM CALIFORNIA, SOUTH CAROLINA, AND GEORGIA, 1921–1929

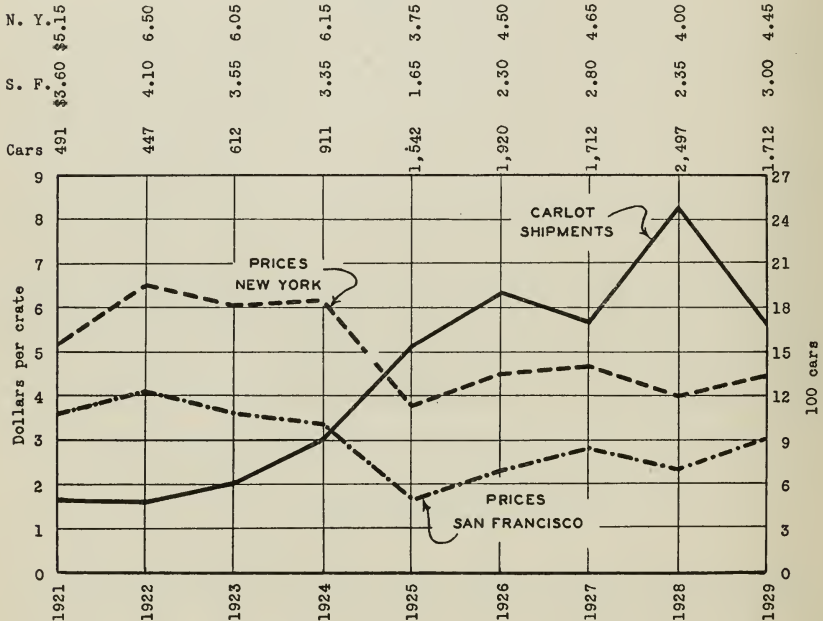


Fig. 20.—As a result of the rapid increase in carlot shipments from the early-shipping states, prices of California asparagus have averaged considerably lower during the past four years than they did between 1921 and 1924.

(Data on carlot shipments from table 7; prices at New York, years 1921–1923 from Producers' Price-Current, years 1924–1929 from table 11; prices at San Francisco, years 1921–1924 from San Francisco Chronicle, years 1925–1929 from table 17. Prices per pound at San Francisco were converted to prices per crate on the basis of 30 pounds per crate.)

Georgia for the years 1921–1929 are shown by the solid line, the annual average jobbing prices of California asparagus at New York and San Francisco by the broken lines. There is a distinct tendency for prices to be high when shipments are small and to be low when shipments are large. The relatively high prices received in 1929 can be accounted for in a large measure by the short crop. In 1925 prices declined more than would ordinarily be expected from the increase in shipments. In that year the quality of the California asparagus,

particularly during April, was poor, which was in part responsible for the low prices received. With even larger shipments in 1926 than in 1925 but also with much better quality, prices averaged about 70 cents a crate higher.

During the past four years prices have averaged \$4.40 a crate at New York and \$2.60 a crate at San Francisco, as against \$5.95 a crate at New York and \$3.65 a crate at San Francisco during the four years of 1921-1924. This decline in prices greatly stimulated consumption. Carlot shipments from the early-shipping states average 1,960 cars a year from 1926 to 1929 as against only 615 cars a year from 1921 to 1924.

JOBGING PRICES OF CALIFORNIA ASPARAGUS AT NEW YORK BY SIZE OF STALKS,  
AVERAGE 1927-1929

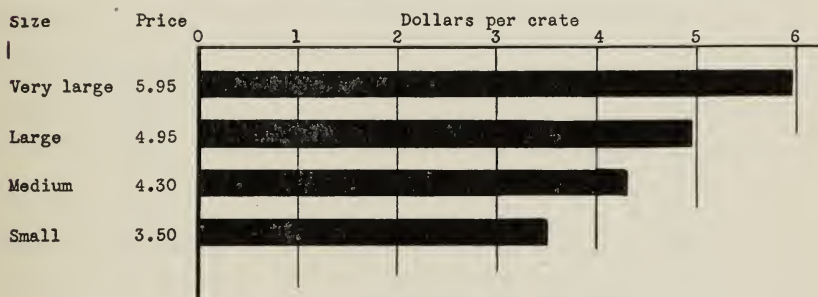


Fig. 21.—A premium is paid for large asparagus.

(Data are from the same sources as table 11.)

*Quality Factors Affecting Asparagus Prices.*—Price quotations of California asparagus at New York are ordinarily reported on four sizes: very large, large, medium, and small. These descriptions refer to the size of the stalk. The average prices of the four sizes during the three years 1927-1929 are given in figure 21. During that period the very large size consistently brought the highest price, with an average differential in its favor of \$1.00 a crate over the large size, \$1.65 a crate over the medium size, and \$2.45 a crate over the small size.

In the Boston market in 1927 Waugh<sup>5</sup> found that the size of the stalk was of less importance than the length of green color in explaining the differences in prices at which individual lots of asparagus sold in the same day. The period of the investigation was from May 6 to July 2 and, therefore, did not cover the time during which the bulk of California asparagus arrived there. His analysis, nevertheless, is

<sup>5</sup> Waugh, Frederick, V. Quality factors influencing vegetable prices. *Journal of Farm Economics* 10(2):185. 1928.

of considerable value to California growers. It indicates that a large premium is paid for green asparagus in the Boston market. Waugh estimates that "an inch of green color was worth 38.5 cents per dozen bunches in the Boston market in 1927. That is, asparagus which was green throughout a length of 6 inches from the tip sold for about 38.5 cents more per dozen bunches than asparagus which had only 5 inches of green color. Asparagus which was cut with 9 inches of green sold at \$3.70 per dozen bunches as compared with \$1.39 for asparagus with only 3 inches of green color. The influence of this one factor explained 41 per cent of the variations in prices found in 200 individual lots," whereas the size of the stalk explained only 15 per cent of the variations in prices.

Although eastern markets prefer green asparagus, it is not always possible for California growers to ship this product with the maximum amount of green. Asparagus shipped to distant markets must usually be cut before the head of the spear opens in order to carry well during the long haul. In the Delta district there is constant danger of frost during the early part of the season. Consequently, the spears are usually cut when only 3 or 4 inches above the ground.<sup>6</sup>

As contrasted with the situation in the eastern markets, the majority of consumers in San Francisco prefer white asparagus, although the demand for green asparagus in this market has been increasing during recent years.<sup>7</sup> Prior to 1925 white asparagus sold from one-half to two cents a pound higher than the green stock. Since then, however, the prices of the two have been approximately the same.

#### ACKNOWLEDGMENTS

The authors of this bulletin wish to express their thanks and indebtedness to the following organizations which have generously contributed from their data and their time: California Cooperative Crop Reporting Service; Bureau of Agricultural Economics, United States Department of Agriculture; Bureau of Foreign and Domestic Commerce, United States Department of Commerce; Division of Agricultural Economics, University of California; California Farm Bureau Federation; California Agricultural Legislative Committee; Canners' League of California; California Packing Corporation; and Libby, McNeil and Libby.

<sup>6</sup> Jones, H. A., and W. W. Robbins. The asparagus industry in California. California Agr. Exp. Sta. Bul. 446:75. 1928.

<sup>7</sup> Hansen, C. J., and O. W. Holmes. Marketing California asparagus, 1927 season. p. 6. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed report.

## APPENDIX OF TABLES

TABLE 12

ASPARAGUS ACREAGE, UNITED STATES BY STATES, 1925-1928

State	1925	1926	1927	1928
	<i>acres</i>	<i>acres</i>	<i>acres</i>	<i>acres</i>
California.....	41,400	56,280	58,380	59,700
New Jersey.....	9,000	10,000	10,500	10,500
South Carolina.....	4,500	5,300	6,400	7,000
Georgia.....	2,820	4,380	4,900	5,640
Illinois.....	2,700	3,050	3,360	3,700
Maryland.....	1,600	1,920	2,120	2,330
Delaware.....	1,200	1,500	1,500	1,920
Washington.....	720	860	1,300	1,740
Pennsylvania.....	1,000	1,000	1,000	1,200
Michigan.....	320	390	480	620
Iowa.....	140	150	200	200
New York.....	130	150	200	200
Oregon.....			160	180
Total.....	65,530	84,980	90,500	94,930

Source of data: U. S. Dept. Agr. Yearbook of Agriculture 1928: 789-790. 1929.

TABLE 13

CANNED PACK OF ASPARAGUS, CALIFORNIA, CANNERS' OPENING PRICES PER DOZEN ON LARGE WHITE IN NO. 2½ SQUARE TINS, AND PRICES PER POUND PAID TO GROWERS FOR NO. 1 CANNING ASPARAGUS, 1910-1929

Year	Canned pack		Canners' opening prices		Prices paid to growers	Index of prices paid by farmers for commodities bought
			Actual	Adjusted		
	1	2	3	4	5	6
	1,000 cases	1,000 boxes	dollars	dollars	cents	1910-1914=100
1910	617	648	2.45	3.50	3.0	98
1911	687	721	2.00	3.08	3.0	101
1912	719	755	2.15	3.11	3.0	100
1913	723	759	2.15	3.07	3.0	100
1914	776	814	2.00	2.94	3.0	101
1915	810	850	2.10	3.00	3.0	106
1916	991	1,040	2.20	2.56	3.0	123
1917	966	1,014	2.60	2.20	3.3	150
1918	902	947	3.15	2.40	3.9	178
1919	1,031	1,083	3.35	2.41	4.6	205
1920	1,025	1,076	4.25	2.76	5.9	206
1921	887	931	2.90	2.90	4.0	156
1922	1,240	1,302	3.15	3.15	4.8	152
1923	1,520	1,596	1.75	3.75	5.9	153
1924	1,793	1,882	3.85	3.85	5.5	154
1925	1,745	1,832	3.10	3.10	3.6	159
1926	2,236	2,348	3.00	3.00	3.8	156
1927	2,190	2,299	3.10	3.10	3.6	154
1928	2,338	2,712	3.25	3.25	4.0	156
1929	2,673	2,995	3.30	3.30	4.0	156

## Sources of data:

Col. 1. Years 1910-1917 from California Fruit News. Years 1918-1929 from Canners' League of California.

Col. 2. Cases converted to cannery boxes containing approximately 50 pounds on the following basis: 1910-1927, 100 cases equals 105 boxes; 1928, 100 cases equals 116 boxes; 1929, 100 cases equals 112 boxes.

Col. 3. California Packing Corporation, Calpak Annuals.

Col. 4. Years 1910-1920 adjusted for changes in the general price level, by dividing by the Bureau of Labor Statistics all-commodity index of wholesale prices, in order to make them comparable with prices since 1920.

Col. 5. Compiled from prices paid by various cannerys.

Col. 6. U. S. Dept. Agr. Bur. Agr. Econ. Index of prices paid by farmers for commodities used in living and production.



TABLE 14

UNITED STATES EXPORTS OF CANNED ASPARAGUS, BY MONTHS, MAY, 1922-APRIL, 1929

Month	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29
	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>	<i>cases</i>
May.....	10,520	26,181	58,096	36,449	40,043	31,168	33,355
June.....	29,014	63,253	52,797	48,044	46,840	61,102	77,363
July.....	30,162	32,164	33,415	36,640	30,558	46,603	41,756
August.....	24,536	30,110	21,386	24,027	30,616	46,113	47,022
September.....	14,576	8,217	10,202	19,661	23,721	31,332	22,154
October.....	6,852	8,257	10,895	20,903	24,872	27,497	41,411
November.....	5,646	7,286	8,304	14,689	17,537	24,715	29,571
December.....	4,812	6,478	7,988	12,332	18,103	26,433	35,337
January.....	2,756	4,298	8,746	10,468	10,690	22,324	32,710
February.....	5,296	4,647	5,049	9,628	13,927	18,890	22,910
March.....	3,316	3,875	7,399	6,966	11,395	15,260	20,461
April.....	1,666	5,468	5,523	13,750	10,443	9,267	10,737
Total.....	139,152	200,234	229,800	253,557	278,742	360,704	414,787

Source of data: U. S. Dept. Commerce, Monthly Summary of Foreign Commerce of the United States. Monthly issues. Data, which were given in pounds, were converted to cases on the basis of 45 pounds to the case.

TABLE 15

WEEKLY CARLOT SHIPMENTS OF ASPARAGUS, UNITED STATES, 1925-1929

Weeks in shipping season	1925	1926	1927	1928	1929*
	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>
1†.....	14	5	6	16	2
2.....	27	27	62	90	16
3.....	82	158	121	229	58
4.....	309	315	226	303	171
5.....	255	285	305	341	344
6.....	282	190	237	405	235
7.....	281	254	203	319	261
8.....	108	240	201	274	290
9.....	91	196	198	252	194
10.....	67	199	133	188	112
11.....	64	136	80	118	98
12.....	64	102	92	72	66
13.....	51	75	74	64	54
14.....	57	65	71	56	32
15.....	61	54	49	51	35
16.....	47	49	47	34	30
17.....	29	32	18	22	19
18.....	7	24	2	12	7
Totals‡.....	1,896	2,406	2,125	2,846	2,024

\* Subject to revision.

† First week, 1925, March 7; 1926, March 6; 1927, March 12; 1928, March 10; 1929, March 9.

‡ Totals do not include 10 cars in February, 1925, 8 cars in October and 5 cars in November, 1926, 6 cars in October and 1 car in November, 1927, and 24 cars in October and 8 cars in November, 1928.

Source of data: U. S. Dept. Agr. Bur. Agr. Econ. Weekly summary of carlot shipments. (Mimographed.)

TABLE 16

WEEKLY CARLOT SHIPMENTS OF ASPARAGUS, UNITED STATES, BY STATES, 1928-1929

Week ending	California	South Carolina	Georgia	Illinois	New Jersey	Washington	Oregon	Other states	Total
	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>	<i>cars</i>
<b>1928</b>									
Mar. 10.....	16								16
17.....	90								90
24.....	229								229
31.....	289	1	13						303
Apr. 7.....	277	26	38						341
14.....	314	66	25						405
21.....	172	107	30			10			319
28.....	121	88	26			38	1		274
May 5.....	87	92	22	25	1	22	3		252
12.....	62	58	4	34	5	22	3		188
19.....	38	25		34	6	15			118
26.....	35			26	1	10			72
June 2.....	36			21	2	5			64
9.....	29			22	2	3			56
16.....	24			19	7	1			51
23.....	11			15	7	1			34
30.....	11			9	2				22
July 7.....	3			8	1				12
Total.....	1,844*	463	158	213	34	127	7		2,846*
<b>1929†</b>									
Mar. 9.....	2								2
16.....	16								16
23.....	58								58
30.....	108	42	21						171
Apr. 6.....	208	105	30	1					344
13.....	72	131	26	6					235
20.....	165	70	15	6		5			261
27.....	143	80	14	23	3	22	5		290
May 4.....	74	51	8	25	3	26	5	2	194
11.....	47	17		14	3	21	8	2	112
18.....	50			18	6	19	4	1	98
25.....	45			11	3	5	2		66
June 1.....	25			17	9	1	1	1	54
8.....	19			10	1		2		32
15.....	23			7	3		1	1	35
22.....	22			6	2				30
29.....	18							1	19
July 6.....	7								7
Total.....	1,102	496	114	144	33	99	28	8	2,024

\* Does not include 24 cars in October and 8 cars in November.

† Subject to revision.

Sources of data: U. S. Dept. Agr. Bur. Agr. Econ. Weekly Summary of Carlot Shipments (mimeographed).

TABLE 17

WEEKLY AVERAGE JOBBING PRICES PER POUND OF WHITE GRADED ASPARAGUS AT  
SAN FRANCISCO, 1925-1929

Week of season	1925	1926	1927	1928	1929
	<i>cents</i>	<i>cents</i>	<i>cents</i>	<i>cents</i>	<i>cents</i>
1*	20.8	32.1	29.2	21.1	33.2
2	17.7	18.5	18.9	14.3	24.1
3	8.6	11.7	17.5	8.2	17.8
4	4.3	6.8	12.0	7.5	13.8
5	4.9	6.4	8.7	8.3	11.3
6	5.0	7.4	10.6	7.0	10.3
7	4.6	6.1	7.4	7.2	8.5
8	6.3	7.2	6.0	6.6	7.3
9	4.7	7.1	6.9	6.1	6.7
10	4.7	7.3	6.7	6.1	6.5
11	5.3	7.8	6.5	5.8	6.1
12	5.1	8.0	6.5	5.8	6.0
Average	5.5	7.7	9.4	7.8	10.0

\* Beginning weeks: 1925, March 7; 1926, March 6; 1927, March 12; 1928, March 10; 1929, March 9.

Sources of data: Early and late weeks from San Francisco Chronicle. All other data for years 1925-1928 from: Hansen, C. J., and O. W. Holmes. Marketing California asparagus. Annual summaries. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed reports. 1929 from U. S. Dept. Agr. Bur. Agr. Econ Daily Market Reports.

Weekly prices are simple averages of daily range of selling prices.

Average prices for the season were obtained by weighting the weekly prices by the carlot shipments from California.



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